

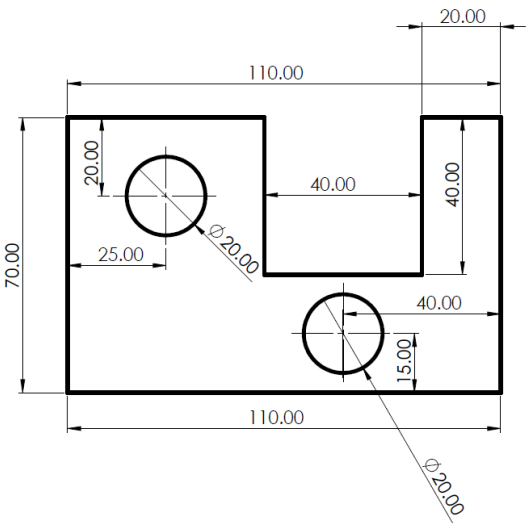


**SCHOOL OF MECHANICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026**

Programme Name & Branch : B.Tech. (BME/BMV/BST)
Course Code : BAEED101
Course Name : Basic Engineering
Faculty Name(s) : Dr. Vinoth Jebaraj A, Dr. G Edison, Dr. Boopathi M,
Dr. Bibin John, Dr. Prakash R, Dr. Deepakkumar R
Class Number(s) : VL2025260106304/6313/ 6316/6319/6321/6326
Date of Examination : 21/08/2025
Exam Duration : 90 minutes **Maximum Marks: 50**

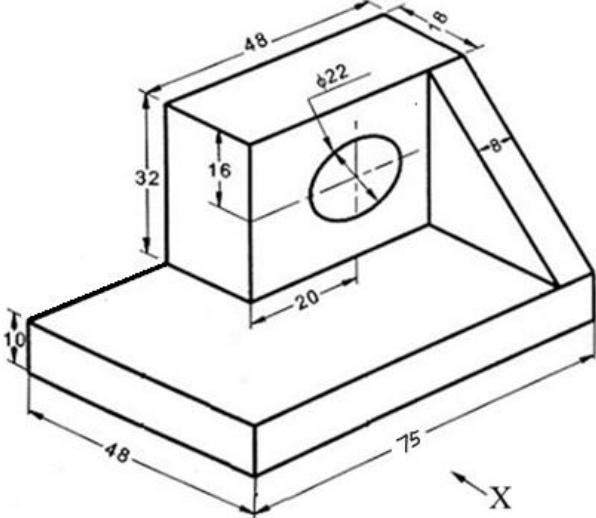
General instruction(s):

- Answer All Questions
- All dimensions of figures provided in the questions are in millimeters (mm)
- All drawings must be executed neatly, using appropriate grades of pencils for different line types.
- Lettering, Numbering and Dimensioning must be done as per the Bureau of Indian standards.
- Orthographic projections must be drawn in landscape orientation within the answer booklet.
- Plan the layout before drawing to ensure adequate space for all required views, including the side view where applicable.
- M - Max mark; CO – Course Outcome; BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)
- Course Outcome Statements:
CO 3: Apply BIS standards to create basic 2D and 3D representations of engineering components.
CO 4: Explain the fundamental principles and applications of manufacturing processes, energy conversion systems, and mechanical automation technologies.

Q. No	Question	M	CO	BL
1.	Identify the dimensioning errors in the given figure, then redraw and dimension it according to BIS standards.  Figure. 1	10	3	3



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2.	A square pyramid of base side 50 mm and axis 70 mm is resting on its base on the HP with a side of base parallel to the VP. Draw its top view and front view.	10	3	3
3.	Pictorial view of an object is shown in Fig. 2. Using first angle projection, draw its (a) front view from the X-direction, (b) top view and c) left-hand side view.  Figure. 2	10	3	3
4.	Draw the isometric view of a vertical cylinder of base diameter 50 mm and axis length 60 mm.	10	3	3
5.	In the casting process, the pattern is a key element that determines the final shape and quality of the cast component. (a) Briefly explain the different types of allowances provided on a pattern. (b) Imagine a situation where shrinkage and draft allowances are neglected in a pattern. What problems could occur in the final casting? Explain with reasoning.	10	4	2

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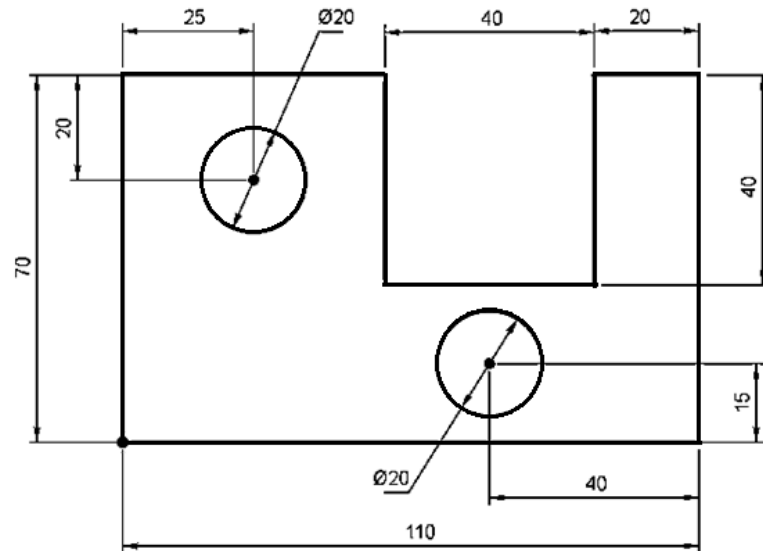
BAEEE101 - BASIC ENGINEERING

CAT - I ANSWER KEY

FACULTY: Dr. A. Vinoth Jebaraj

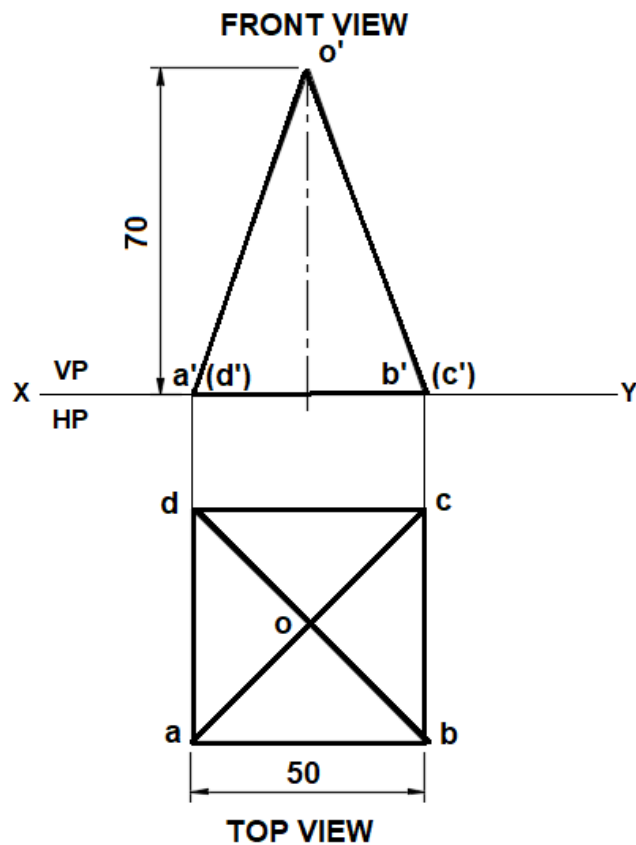
SLOT: E2+TE2

Q1.

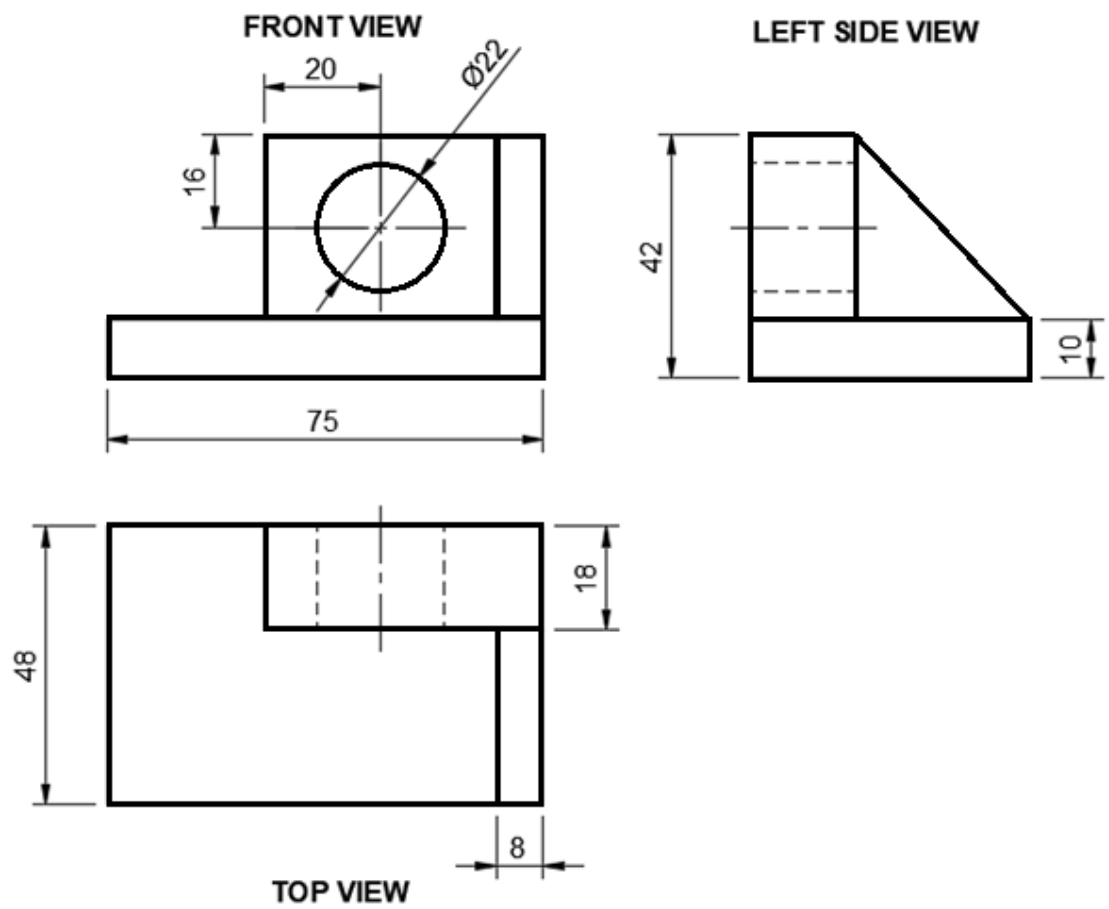


ALL DIMENSIONS ARE IN mm

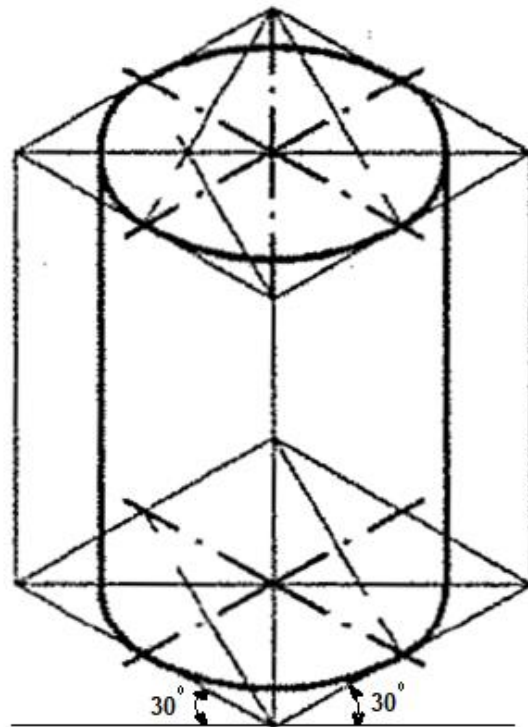
Q2.



Q3.



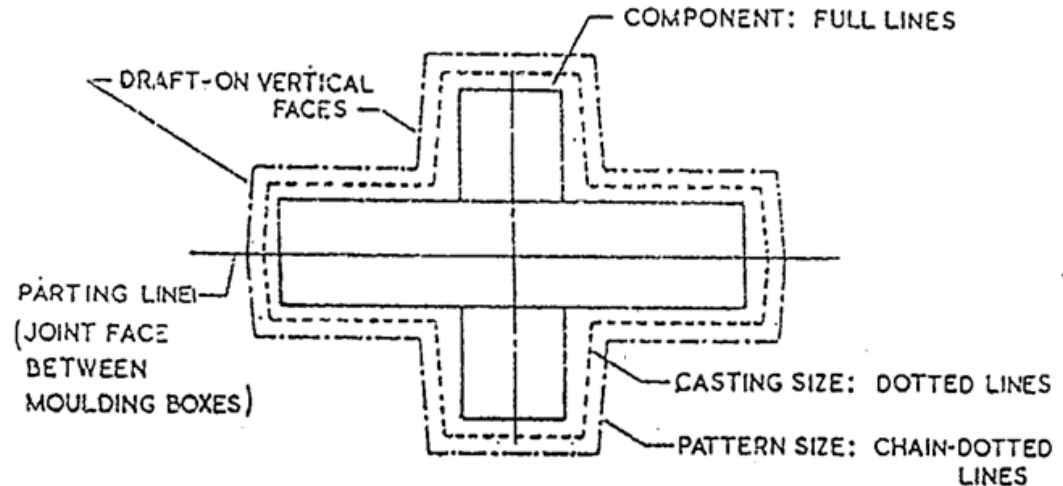
Q4.



Q5.

Different Types of allowances provided on the pattern

- Shrinkage allowance
- Machining allowance
- Draft allowance



Shrinkage allowance: The pattern used for creating the mold cavity is usually designed with larger size than the final cast product. It is mainly due to the shrinkage experienced by the cast component when it is transformed from molten state to solid state. Different values of shrinkage allowances will be given based on the type of materials and the contraction nature when undergoing cooling action.

Machining allowance: The surface roughness of the as-cast product is generally higher which is usually not acceptable during service in certain applications. Hence, the post machining process is required to improve the surface morphology of the cast product. In order to do post machining, extra material is added in the pattern such that it will be removed after casting by means of machining process.

Draft allowance: The vertical surfaces of the pattern i.e. the surfaces that are perpendicular to the parting line of the mold is usually made with slight angularity. This type of allowance is known as draft allowance. It is essential to remove the pattern from the mould without any kind of damage.

If shrinkage allowance is not provided on the pattern, then the final cast component dimensions will be smaller than the targeted dimensions. This will lead to malfunctioning of parts during service or sometimes it will not satisfy the assembly requirement.

If draft allowance is not provided on the pattern, then the removal of the pattern from the sand mold will be difficult which may cause damage on the mold surfaces. This will also lead to defects in the cast component.